



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/776,645	02/10/2004	Joel Kindem	07402-001001	1750
74162	7590	01/16/2008		
Law Office of Scott C Harris PO Box 1389 Rancho Santa Fe, CA 92067			EXAMINER LEE, SHUN K	
			ART UNIT 2884	PAPER NUMBER
			MAIL DATE 01/16/2008	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

TH

**Office Action Summary****Application No.**

10/776,645

**Applicant(s)**

KINDEM ET AL.

**Examiner**

Shun Lee

**Art Unit**

2884

**– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –**  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 November 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-7, 9, 11-14, 16-26, 29 and 32-52 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9, 11-14, 16-26, 29 and 32-52 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Specification*

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 1-7, 11-14, 17-21, 24, 29, and 32-52 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Amended independent claim 1 recites the limitation "wherein said bridge has specified surfaces between the pixels that hold said array of scintillator material of said array at least partly within said pre-formed reflector" and amended independent claim 37 recites the limitation "wherein said bridging portion has specified surfaces that hold said array two dimensionally within said pre-formed reflector". Bridge surfaces that are not in contact with the pixels do not appear able to provide forces that would hold the scintillator at least partly within the pre-formed reflector. The specification discloses (paragraph 27) that " ... the pixels 202 of array 201 are

held in the appropriate position relative to each other by surfaces of an exit window bridge 205 spanning the gaps 206 between the pixels 202. ... the exit window bridge 205 may be made of scintillator material left uncut in the fabrication of the gaps 206. In other embodiments the exit window bridge 205 may be formed of a material different from the scintillator and attached to the exit windows 207 of the pixels 202 ... ” and (paragraph 38) that “ ... In cases where the pre-formed reflector may not provide a snug fit for pixels within some range of sizes, a variety of provisions can be made to ensure that the scintillator pixels remain in place during use and to control the effect of any voids resulting from dimensional mismatch between the reflector and the scintillator pixels. For example, as an alternative to the press fit, the individual scintillator pixels may be held in position by bonding exit faces of the scintillator assembly to the input window or windows of the photodetector ... ”. Thus the specification teaches that in at least some embodiments, the scintillator is held at least partly within the pre-formed reflector by a snug fit or bonding. However, there does not appear to be any disclosure of how specified bridge surfaces were used to hold the scintillator at least partly within the pre-formed reflector. Therefore, the specified bridge surfaces were not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Amended independent claim 44 recites the limitations “ ... wherein said shape mates with, and is held in place by, corresponding surfaces on said preformed reflector ... and performing a protrusion on at least one of said inner surfaces of said reflector for forming at least one air gap between adjacent scintillator material surfaces and the reflector”. However when a scintillator material surface is separated from an adjacent reflector surface by an air gap, that particular scintillator material surface is not in contact with and thus cannot be held in place by

that particular adjacent reflector surface. Thus, amended independent claim 44 recites limitations that appear to conflict with other recited limitations. Therefore, an air gap in combination with a shape that mates with, and is held in place by, corresponding surfaces on a preformed reflector were not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

4. Claims 1-7, 11-14, 17-21, 24, 29, and 32-52 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Applicant has not pointed out where the amended claim is supported, nor does there appear to be a written description of the claim limitations "wherein said bridge has specified surfaces between the pixels that hold said array of scintillator material of said array at least partly within said pre-formed reflector" or "wherein said bridging portion has specified surfaces that hold said array two dimensionally within said pre-formed reflector" in the application as filed.

Further, applicant has not pointed out where the amended claim is supported, nor does there appear to be a written description of the claim limitations " ... wherein said shape mates with, and is held in place by, corresponding surfaces on said preformed reflector ... and performing a protrusion on at least one of said inner surfaces of said reflector for forming at least one air gap between adjacent scintillator material surfaces and the reflector" in the application as filed.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 44 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Amended independent claim 44 recites the limitations " ... wherein said shape mates with, and is held in place by, corresponding surfaces on said preformed reflector ... and performing a protrusion on at least one of said inner surfaces of said reflector for forming at least one air gap between adjacent scintillator material surfaces and the reflector". However when a scintillator material surface is separated from an adjacent reflector surface by an air gap, that particular scintillator material surface is not in contact with and thus cannot be held in place by that particular adjacent reflector surface. Therefore, amended independent claim 44 recites limitations that appear to conflict with other recited limitations.

***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Freund *et al.* (WO 02/25311 A1) in view of DiBianca *et al.* (US 4,429,227) and Skillicorn *et al.* (US 5,550,378).

It should be noted that US Patent 6,894,282 B2 (Freund *et al.*) corresponds to WO 02/25311 A1 (Freund *et al.*).

In regard to claim 9, Freund *et al.* disclose (Figs. 5 and 6) a scintillator assembly, comprising:

- (a) a scintillator material (4), having outer surfaces of a first shape; and
- (b) a preformed reflector (5), having inner surfaces which each mate with said first shape to contain said scintillator material (4) at least partly within said pre-formed reflector (5).

The assembly of Freund *et al.* lacks forming at least one air gap between a wall of the reflector and a surface of the scintillator material with a spacer formed by a protrusion that is part of said inner surface of said preformed reflector. However, DiBianca *et al.* teach (column 5, lines 9-34) to provide at least one air gap longer than a wavelength of light between a wall of the reflector and a surface of the scintillator material with a bonding material (100 in Fig. 5), in order to enhance light collection efficiency. Further, Skillicorn *et al.* teach (column 6, lines 12-13) to provide stretched wires to align the placement of scintillator elements. Therefore it would have been obvious to one having

ordinary skill in the art at the time of the invention to form protrusions as a part of the one-part reflector's inner surfaces in the assembly of Freund *et al.* for accurate placement of scintillator elements, in order to obtain air gaps longer than a wavelength of light between scintillator surfaces and reflector walls so as to enhance light collection efficiency.

10. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Freund *et al.* (WO 02/25311 A1) in view of O'Kane Sr. *et al.* (US 2002/0060300) and Hoffman *et al.* (US 6,087,665).

In regard to claim 16, Freund *et al.* disclose (Figs. 5 and 6) a scintillator assembly, comprising:

- (a) an array of scintillator material comprising plural pixels (4) of separated scintillator material, each having outer surfaces of a first shape, and a bridge (*i.e.*, "base plate"; US 6,894,282 column 4, lines 57-66) holding together the plural separated pixels (4) in a specific geometry; and
- (b) a preformed reflector (5), having plural inner surfaces which each mate with said array of plural separated pixels (4), to contain each of said pixels (4) of scintillator material at least partly within said pre-formed reflector (5).

The assembly of Freund *et al.* lacks that the scintillator comprises different materials and an explicit description that the plastic reflector comprises polyethylene. However, Freund *et al.* also disclose (US 6,894,282 column 2, lines 58-65) a plastic reflector. Since Freund *et al.* do not disclose and/or require a specific plastic, one having ordinary skill in the art at the time of the invention would reasonably interpret the unspecified



plastic of Freund *et al.* as any one of the known conventional plastics that would not require further description. Further, O'Kane Sr. *et al.* teach (paragraphs 46-49) that plastics comprise polyethylene. In addition, Hoffman *et al.* teach (column 4, lines 28-33) to provide different scintillator materials so as optimize specific detector characteristics. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a known conventional plastic (e.g., polyethylene) as the unspecified plastic in the assembly of Freund *et al.*, and to optimize specific detector characteristics by providing different scintillator materials.

11. Claims 22 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freund *et al.* (WO 02/25311 A1) in view of DiBianca *et al.* (US 4,429,227) and Skillicorn *et al.* (US 5,550,378) as applied to claim 9 above, and further in view of DiFilippo (US 6,078,052).

In regard to claims **22** and **23** which are dependent on claim 9, the modified assembly of Freund *et al.* lacks a light guide (e.g., a wavelength shifting optical fiber). However, wavelength shifting optical fibers are well known in the art. For example, DiFilippo teaches (column 3, line 21 to column 4, line 8) to provide wavelength shifting optical fibers in order to enhance collection efficiency. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide wavelength shifting optical fibers in the modified assembly of Freund *et al.*, in order to enhance collection efficiency.

12. Claims 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Freund *et al.* (WO 02/25311 A1) in view of DiBianca *et al.* (US 4,429,227) and

Skillicorn *et al.* (US 5,550,378) as applied to claim 9 above, and further in view of O'Kane Sr. *et al.* (US 2002/0060300).

In regard to claim **25** (which is dependent on claim 9) and claim **26** (which is dependent on claim 9), Freund *et al.* also disclose (US 6,894,282 column 4, lines 10-16) titanium dioxide as an additive to the reflector material. The modified assembly of Freund *et al.* lacks an explicit description that the plastic reflector comprises polyethylene. However, Freund *et al.* further disclose (US 6,894,282 column 2, lines 58-65) a plastic reflector. Since Freund *et al.* do not disclose and/or require a specific plastic, one having ordinary skill in the art at the time of the invention would reasonably interpret the unspecified plastic of Freund *et al.* as any one of the known conventional plastics that would not require further description. Further, O'Kane Sr. *et al.* teach (paragraphs 46-49) that plastics comprise polyethylene. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a known plastic material (e.g., polyethylene) as the unspecified plastic reflector material in the modified assembly of Freund *et al.*

### ***Response to Arguments***

13. Applicant's arguments filed 13 November 2007 have been fully considered but they are not persuasive.

Applicant's arguments with respect to some of the amended independent claims have been considered but are moot in view of the new ground(s) of rejection.

Applicant argues that a protrusion forming a spacer to form the air gap is not suggested by any of the cited prior art since a protrusion is much simpler than

DiBianca *et al.*'s system of using an adhesive to form an air gap. Examiner respectfully disagrees. DiBianca *et al.* teach the advantages of providing an air gap and Skillicorn *et al.* teach the advantages of providing alignment structure. Therefore, the combination of the cited prior art would have taught or suggested to one of ordinary skill an integral alignment structure that also forms an air gap.

Applicant also argues that nothing in the cited prior art teaches a preformed reflector with different materials of the reflector formed of different materials since Hoffman *et al.* only disclose that different scintillator materials could be used for different purposes. Examiner respectfully disagrees. Hoffman *et al.* teach the advantages of providing different scintillators along the transverse and/or the lateral direction. Therefore, the combination of the cited prior art would have taught or suggested to one of ordinary skill reflector, at least one scintillator pixel comprises at least one material different from a second material of another scintillator pixel.

### **Conclusion**

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the


shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (571) 272-2439. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SL



SHUN LEE  
11/21/2011